REMARKS

The Examiner rejects Claim 2 and 10 under 35 U.S.C. §112 because the term "a percentage" allegedly renders the claim indefinite. Applicants have amended Claims 2 and 10 to overcome this rejection.

The Examiner is rejecting all of the pending claims in this matter under 35 U.S.C.§102(b) as being anticipated by the Lee article entitled "Wide Area ATM Network Experiments Using Emulated Traffic Sources" and under 35 U.S.C.§103(a) as being obvious over U.S. 6,597,660 to Rueda et al. in view of the Kang article entitled "Two-State MMP Modeling of ATM superposed Traffic Streams Based on the Characterization of Correlated Interarrival Times".

Applicant respectfully traverses the Examiner's rejections.

The present invention is directed to an ATM traffic simulator that uses a lognormal number generator to simulate packet interarrival times for packets containing voice and/or video information and a normal number generator to simulate packet interarrival times for packets containing information other than voice and/or video information. The two types of simulated interarrival times are then combined to provide the interarrival time distribution for the combined traffic stream.

The various cited references fail to teach or suggest at least the following italicized features of the independent claims:

> 1. A method for characterizing packet interarrival times on an ATM network, comprising:
>
> providing (a) a number of packets in a first portion of a plurality of packets that will be or have been transported on an ATM network, the packets in the first portion containing at least one of voice and video information, and (b) a number of packets in a second portion of the plurality of packets, the packets in the second portion containing information other than the at least one of voice and video information;

generating *with a lognormal number generator* a plurality of packet interarrival times values corresponding to at least some of the packets in the first portion ; and

generating *with a normal number generator* a plurality of packet interarrival times corresponding to at least some of the packets in the second portion.

8. A method for simulating traffic in an ATM network, the ATM network transporting a stream of packets, the packet stream including a plurality of packets, comprising:

generating an at least substantially *lognormally distributed* set of packet interarrival times corresponding to the plurality of packets.

16. A system for simulating traffic on an ATM network, wherein a plurality of packets are in a packet stream that will be or have been transported on an ATM network, the system comprising:

lognormal number generating means for generating an at least substantially *lognormally distributed* plurality of values corresponding to the plurality of packets.

26. A system for characterizing traffic on an ATM network, wherein first and second pluralities of packets are in a packet stream that will be or have been transported on an ATM network, the system comprising:

a *lognormal number generator* operable to generate a plurality of at least substantially *lognormally distributed* values corresponding to the first plurality of packets;

a *normal number generator* operable to generate a plurality of at least substantially *normally distributed* values corresponding to the second plurality of packets; and

a combiner, in communication with the lognormal random number generator and the normal random number generator, operable to combine the plurality of at least substantially lognormally distributed values and the plurality of at least substantially normally distributed values to provide an aggregate stream of values.

The Lee Article

Lee is directed to wide area network testbeds using the Asynchronous Transfer Mode or ATM. To provide realistic experiments, realistic traffic flows are required to be generated. The flows are used for both network design and to evaluate traffic shaping routing algorithm and control mechanisms.

In connection with generating realistic ATM traffic flows, Lee teaches that TELNET and FTP session arrivals are modeled by a *Poisson* distribution (Lee at pages 19 and 23); that TELNET and

FTP session interarrival times and WWW requests are *exponentially distributed* (*id.* at pages 20, 23, and 47); and that TELNET packet interarrival times and WWW traffic fit a *Pareto* distribution (*id.* at pages 21 and 47). Lee further teaches that VBR video traffic has a constant frame interarrival time and the number of cells per frame is modeled by a gamma distribution (*id.* at page 26); that the interframe period for MPEG video streams is constant and MPEG scene length has a geometric distribution (*id.* at page 28); and that WWW cell level fits a homogeneous Poisson distribution and that the document transfer size fits a Pareto distribution (*id.* at page 31). Although Lee mentions both normal and lognormal distributions, it teaches that only TELNET session durations (*id.* at page 20), FTP item sizes (*id.* at page 25), and MPEG frame size (*id.* at page 29) are each lognormally distributed. Although Lee mentions normal distributions (Table 4.1), Lee fails to specifically say what item is normally distributed.

By teaching that packet interarrival times fit a Pareto distribution, Lee teaches away from the use of normal or lognormal distributions, let alone the combination of the two, for modeling ATM packet interarrival times.

<u>Rueda et al.</u>

Rueda et al., as admitted by the Examiner, does not specifically teach that packet interarrival times are both lognormally and normally distributed. Rather, the Examiner states that the patent's reference to "mean and variance modeling" implies such distributions to one of ordinary skill in the art. However, as shown by the attached listing of distributions in Exhibit "B" many types of probability distributions are considered to be both mean and variance modeling - or have both a mean and variance. As will be appreciated, any continuous random variable having a probability

density function has both a mean or expected value and a variance (Exhibit "A"). Examples of such functions listed in Exhibit "B" include not only normal and lognormal distributions but also uniform distributions, exponential distributions, Beta distributions, Cauchy distributions, t distributions, F distributions, Chi-Square distributions, Weibull distributions, Fatigue Life distributions, gamma distributions, double exponential distributions, Power Normal or Pareto distributions, Power Lognormal distributions, Tukey-Lambda distributions, extreme value type I distributions, binomial distributions and Poisson distributions. Moreover, there is nothing in Rueda et al. that suggests that differing types of ATM packets are characterized by differing distribution functions.

<u>The Kang Article</u>

Kang is directed to the characterization of ATM packet interarrival times using two-state MMPP modeling techniques. At page 1425, the individual traffic sources are modeled by an interrupted Poisson process (IPP). The IPP is a two-state MMPP in which the arrival rate is 0 in OFF state. The Kang article, like the Lee article, thus teaches away from the use of either a lognormal or normal distribution, let alone the combination of the two, for modeling ATM packet interarrival times.

Accordingly, the pending claims are allowable.

The dependent claims provide additional reasons for patentability.

Based upon the foregoing, Applicants believe that all pending claims are in condition for allowance and such disposition is respectfully requested. In the event that a telephone conversation would further prosecution and/or expedite allowance, the Examiner is invited to contact the undersigned.

Respectfully submitted,

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